

RUGANODONTITES, A NEW SUBGENUS OF SOUTH AMERICAN
PEARLY, FRESH-WATER MUSSELS

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The shells of the genus *Anodontites*, to which this new subgenus belongs, have no hinge teeth, practically no beak sculpture, and but few other characters which can be used for classifying them into groups. The surface sculpture seems to offer one means of dividing them into subgenera or sections, and it is this feature which has been used in defining the new subgenus *Ruganodontites*. Notes are added hereto relating to the minute radial sculpture found on many South American and African Naiades.

RUGANODONTITES, new subgenus of ANODONTITES.

Shell elongate, thick, usually somewhat falcate, with a broad, shallow depression running from the beaks to the middle of the ventral margin. Periostracum thick, microscopically radiately striate, much puckered and wrinkled as if from shrivelling, the wrinkling occurring also in the calcareous portion of the shell. The wrinkles are obscurely divided into narrow, gradually widening rays extending from the beaks to the margin. Nacre greenish-livid. Type *Anodontites colombiensis* Marshall.

1921 *Anodontites colombiensis* Marshall (Proc. U. S. Nat. Mus. Vol. 61, art. 16, No. 2437, p. 7, pl. 1, fig. 5; pl. 2, figs. 13, 14; pl. 3, figs. 5, 13, 14).

1921 *Anodontites crispata* Ortmann (Mem. Carnegie Museum, VIII, p. 589, pl. 40, figs. 7, 8; pl. 41, figs. 2, 3). Not *Anodontites crispata* Bruguière, 1792.

Type locality: Rio Colorado, Province of Santander, Republic of Colombia. The Colorado is in the Caribbean drainage system. It is tributary to the Rio Magdalena and lies on the western slope of the Cordillera Oriental. High mountains separate the Magdalena and its tributaries from the great areas drained by the Orinoco and Amazon River systems.

The National collection contains the type and three paratypes (Cat. No. 341472) collected and presented by Dr. C. Wythe Cooke. Also two specimens from the Rio Sucio, near Dos Bocas, Santander, Republic of Colombia (Cat. No. 365,-313) collected and presented by Mr. T. A. Link. Also two specimens (Cat. No. 381553) from Rio de la Paila, at Paila, Republic of Colombia, presented by the Carnegie Museum. This river is a tributary of the Rio Cauca, which in turn is tributary to the Magdalena, which it joins about 100 miles from the Carribbean Sea. These specimens were collected by Eigenmann in 1912, and were part of the lot treated by Ortmann (l. c.) as *Anodontites crispata* Bruguière.

This species is important not only as being the type of the new subgenus, *Ruganodontites*, but also as being the species which Ortmann took to be the true *A. crispata* Brug., the type of the genus *Anodontites*. Had Ortmann's identification been correct it would have resulted in throwing *Styganodon* von Martens into the synonymy of *Anodontites* s. s., but *Styganodon* (type *A. tenebricosa* Lea) is subgenerically different from *Anodontites* s. s. (type *A. crispata* Brug.), and *A. crispata* Ortmann is subgenerically different from both. (See Marshall, NAUTILUS XLIII, pp. 128-131, 1930.)

At present the only other species known to fall into the new subgenus is

ANODONTITES (RUGANODONTITES) NAPOENSIS Lea.

- 1868 *Anodonta napoensis* Lea (Proc. Acad. Nat. Sci. Phila., Vol. 12, p. 162; Journ. Acad. Nat. Sci., Vol. 6, p. 324, pl. 53, fig. 157).
 1869 *Anodonta napoensis* Lea (Obs. on Genus Unio, Vol. 12, p. 84, pl. 53, fig. 157).
 1900 *Glabaris napoensis* Simpson (Proc. U. S. Nat. Mus., Vol. 22, No. 1205, p. 920).
 1914 *Anodontites* (*Anodontites*) *napoensis* Simpson (Descr. Cat. Naiades, Vol. 3, p. 1417).

The National Museum contains Lea's type (Cat. No. 25429) and one other specimen also received from Lea (Cat. No. 86608). Both came from the Napo River, Ecuador. This is in the Upper Amazon drainage. The periostracal sculp-

ture and that of the underlying calcareous portion of the shell almost exactly mimic this feature of the type species.

The fact that the new subgenus is based mainly on sculpture will testify that I count this feature of considerable importance in the South American Naiades. As a rule the naiad shells are so large and of such crude structure that the use of a lens and the microscope have been neglected in studying their external details. In 1922 while I was examining with a lens a specimen afterward described as *Diplodontites cookei*, the light by mere accident fell upon the specimen in such a way as to show hints of a minute, radial sculpture of a kind hitherto unknown in the Naiades. Microscopical examination revealed exceedingly fine radiating threads, numbering 90 or more to the millimeter. Examination of many of the South American and some of the African Mutelidae proved that similar microscopic sculpture occurs on practically all specimens in good condition.

It is necessary to explain here that in this paper the family name Mutelidae is used in the sense in which it was used by Simpson in 1900 in his Synopsis of the Naiades, and is equivalent to Ortmann's subfamily, Mutelinae. As defined by Ortmann, his family Mutelidae includes not only Simpson's family Mutelidae in a subfamily Mutelinae, but is enlarged to include also a subfamily Hyriinae for all other South American Naiades then known and which had been placed by Simpson in the family Unionidae. The Hyriinae have *glochidia*. Ortmann has figured a number of them; and I have seen them in at least one species, *Diplodon huapensis* Bartsch. According to Ihering the Mutelinae have *lasidia*, which, consisting of three pieces, are essentially different from *glochidia* which have but two pieces. *Glochidia* and *lasidia* could not logically be placed in the same family. Therefore, at the present time Ortmann's classification can not be accepted as more than a suggestion. If it be proved that Ihering's observations were erroneous (as we are inclined to think they were) and that the Mutelinae have *glochidia*, not *lasidia*, then the way is cleared for acceptance of Ortmann's arrangement. Just now the most important

need in the study of the South American Naiades is confirmation or denial of the correctness of Ihering's statements concerning *lasidia*. At present he is the only one claiming to have seen embryos of that kind.

Examination of great numbers of Naiades of families other than the Mutelidae shows that this fine sculpture apparently is found in the Mutelidae only. It seems marvelous that for more than 130 years it could have escaped the attention of naturalists, including Bruguière, who described the first species, *Anodontites crispata*, in 1792. It was somewhat of a shock to me to realize that I, too, in 40 years' work, had never seriously studied the external features of these shells under high magnification and that the finding of new details was due to an accident and not to my own, directed intelligence. Since then the Naiades have had a new meaning to me, and now I do not feel that I have made a full acquaintance with the shell of any particular species until I have examined it in five ways, viz.: 1st by touch and "heft;" 2d by the unaided eye; 3d by the use of a fairly strong hand lens to bring out sculpture, which, though evidently present, is too small for the eye to interpret. The use of great magnification at this stage results in making things too big for the eye to appreciate. 4th by the use of a microscope to bring out minute details. 20 to 50 diameters is usually sufficient, and, of course, reflected light should be used. 5th by immersing a portion of one valve in boiling potash-solution for a few minutes in order to remove the periostracum from that part. The sculpture on the white calcareous surface of the shell will be found to be the same as that seen on the periostracum by the unaided eye, or by the use of a hand lens. The microscopic radiating threads remain invisible, probably because the calcareous surface is much pimpled and pitted by the ends of the tiny hexagonal prisms of the prismatic structure.

In addition to the above it is well to have also some weather-worn specimens. A broken specimen will show the thickness of the prismatic and nacreous layers. In some of the South American Mutelidae the former is very thick, and

its color throughout may be white, or sometimes of a delicate pinkish or greenish tint.

It is generally believed that the faunae of South America and West Africa are distinctly related. The microscopic sculpture of the Mutelidae of the two regions offers another though slight confirmation of this belief. If the Mutelidae of the two regions had a common ancestry it is striking that a minute detail like this should have survived the great changes wrought by Nature through the use of time, place, circumstance, segregation, or any or all of the elements which are supposed to enter into the variations found in animal form and structure.

Still unanswered is the old query: "Which came first, the hen or the egg?" The survival of details during the progress of variation might give rise to another query: Which lasts longer, basic structure or apparently unimportant details?

DESCRIPTION OF A NEW DESERT HELICID SNAIL

BY HENRY A. PILSBRY AND STANLEY C. FIELD

HELMINTHOGLYPTA GRANITICOLA ARIDA, new subspecies.
Vol. 44, pl. 7, fig. 5.

Hill opposite cement quarry, 5 miles north of Victorville, San Bernardino Co., California. Type and paratypes coll. ANSP., collected by Mr. Stanley C. Field; other paratypes in his collection.

The shell is depressed, umbilicate, the umbilicus contained 6 to 6½ times in the diameter: between cinnamon-buff and chamois colored, with a narrow chestnut band above the periphery. The surface is somewhat glossy. First third of a whorl is smoothish, followed by an area of rather coarse radial wrinkles, partly interrupted into oblong granules, continuing nearly to the end of the first whorl, then changing to fine, wavy radial wrinkles. On the intermediate